CALIFORNIA INSTITUTE OF TECHNOLOGY

PASADENA, CALIFORNIA 91109

NORMAN BRIDGE LABORATORY OF PHYSICS

17 March 1966

Mr. John R. Craig, III
Office of Space Science and Applications
National Aeronautics and Space Administration
Washington 25, D. C. 20546

Dear Mr. Craig: Re. Semi-Annual Report on NASA Grant NGR-05-002-040 California Institute of Technology.

This is a brief semi-annual report of work performed under NASA Grant NGR-05-002-040 to the California Institute of Technology. During the six-months period ending 28 February 1966. Work has been divided into two phases both with the objective of determining absolute oscillator strengths of lines in the spectra of atoms or ions.

(1) Measurements of the absolute oscillator strengths of lines in the neutral spectra of copper and cadmium have been carried out using the atomic beam apparatus. During the course of this work the behavior of several recent modifications in the apparatus were checked out and found to improve the accuracy and reliability of the method as well as facilitating the performance of the experiments.

(2) The design of an ion source has been completed and the apparatus is now being constructed. It is intended that this source will be used both in connection with the atomic beam apparatus and with a Van de Graaff accelerator. It is designed to produce ions of iron and other heavier metals. When used with the atomic beam apparatus it is hoped that it will produce singly ionized metals in sufficient quantities so that the absolute oscillator strengths of lines in their spectra may be measured. Used with the Van de Graaff, the ions will be accelerated and then stripped of more electrons by passing them through a foil. It is hoped that observations of the recombination spectra will yield information on the life-times of some of the excited states of several stages of ionization. From these results the oscillator strengths of some of the important lines in the ionic spectra may be determined.

Very truly yours,

Robert B. King

Robert B. King
Professor of Physics

RBK:bb